Dwr Cymru Meeting Notes

Wye Salmon Association Comments from Monmouth

Morgan Jones - 19/08/21

Please note the graphs used in this document are purely experimental and use my data thus far

Wye Salmon Association
www.wyesalmon.com

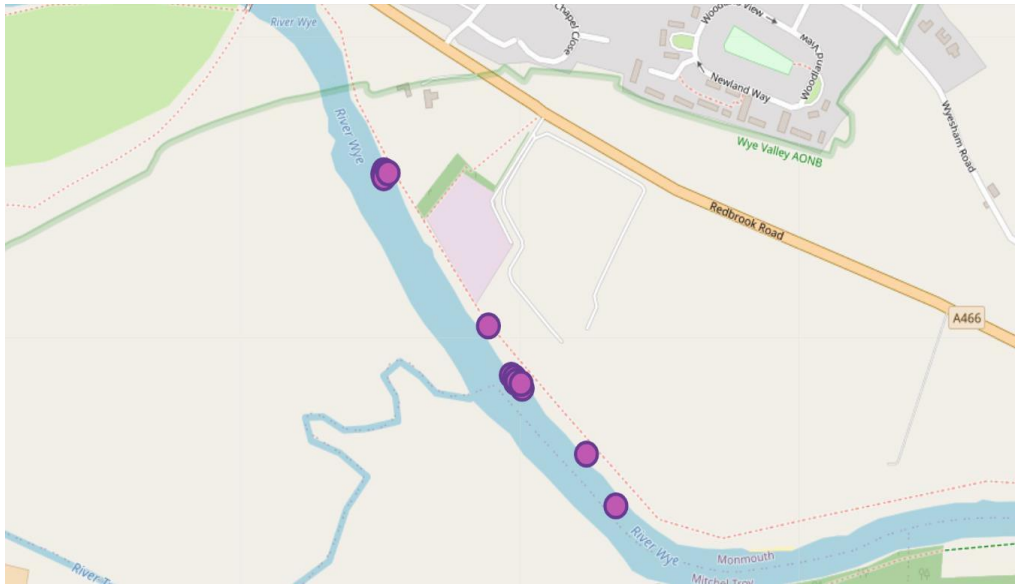
Site Overview

1. **Monmouth STW Redbrook Road**

- Map Reference: 51.801327, -2.702709

- WSA Monitoring with main focus on Phosphate (mg/l) above and below STW

- Additional parameters monitored including Ecoli, Nitrate, pH, TDS, Temperature, Water Level, Agricultural Activity, Water Colouration and Weather Conditions



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In 2020 this sewer storm overflow spilled 86 times for a total of 1163 hours.

Permit No: AN0353501

% of reporting period EDM operational: 100 %

a: sewage discharges - final/treated effluent - water company

Discharging into River Wye.

Permit No: AS1003201

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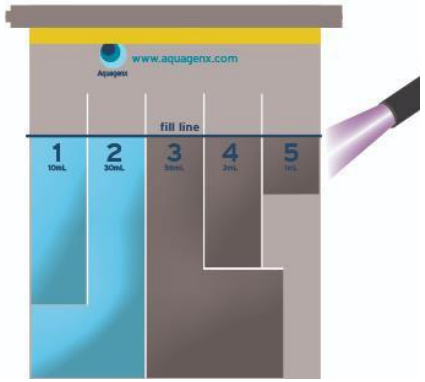
Ecoli Results Summary

- Both Water above and below contained ecoli
- above was regarded as high risk and probably unsafe using the **Aquagenx kit** and WHO guidelines
- Below was regarded as **4x the recommended level as per bathing water standards** despite allowing for 50% error factor in results and **serious risk of illness** as stated by the rivers trust
- Monmouth STW is a trickling filter works state the rivers trust hydraulic stress
- Results >100 MPN/100ml
- **94351 cfu/100ml at 95% confidence limit**
- Suggest professional lab testing for higher accuracy over large ranges



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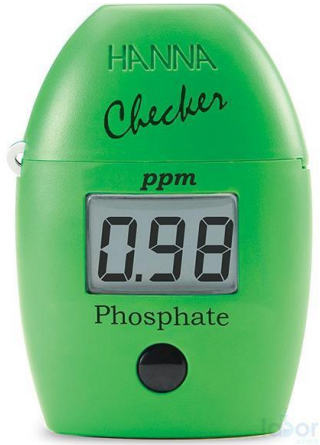
Phosphate Conclusions

- Phosphate was recorded above the STW with an average result of 0.04 mg/l
- Phosphate was recorded below the STW at the appropriate mixing rate (3x width of river channel) downstream from the outflow pipe with an **average reading of 0.37 mg/l**
- Most recent reading (yesterday) 0.53 mg/l



- The **difference** between average upstream and downstream values was **0.33** (across 17+ recordings)
- Phosphate remains persistently high (> 0.15 mg/l) even several hundred yards below the STW

- The impact of the river Trothy was discussed following discussion with Dwr Cymru. However, as directly opposite the confluence (as shown on the map) the mixing of P across the river (with the general flow direction of the water) would not be possible and result in no impact in this location. Additionally, the Trothy continues to be monitored by WSA volunteers, but (despite also showing high phosphate) can not justify/be the primary contributor for the extremely high readings being produced below the STW.
- Average readings **were 2.47 times that of the standard set by the WFD** to achieve good ecological status for this section of the river based on underlying geology and topographic factors

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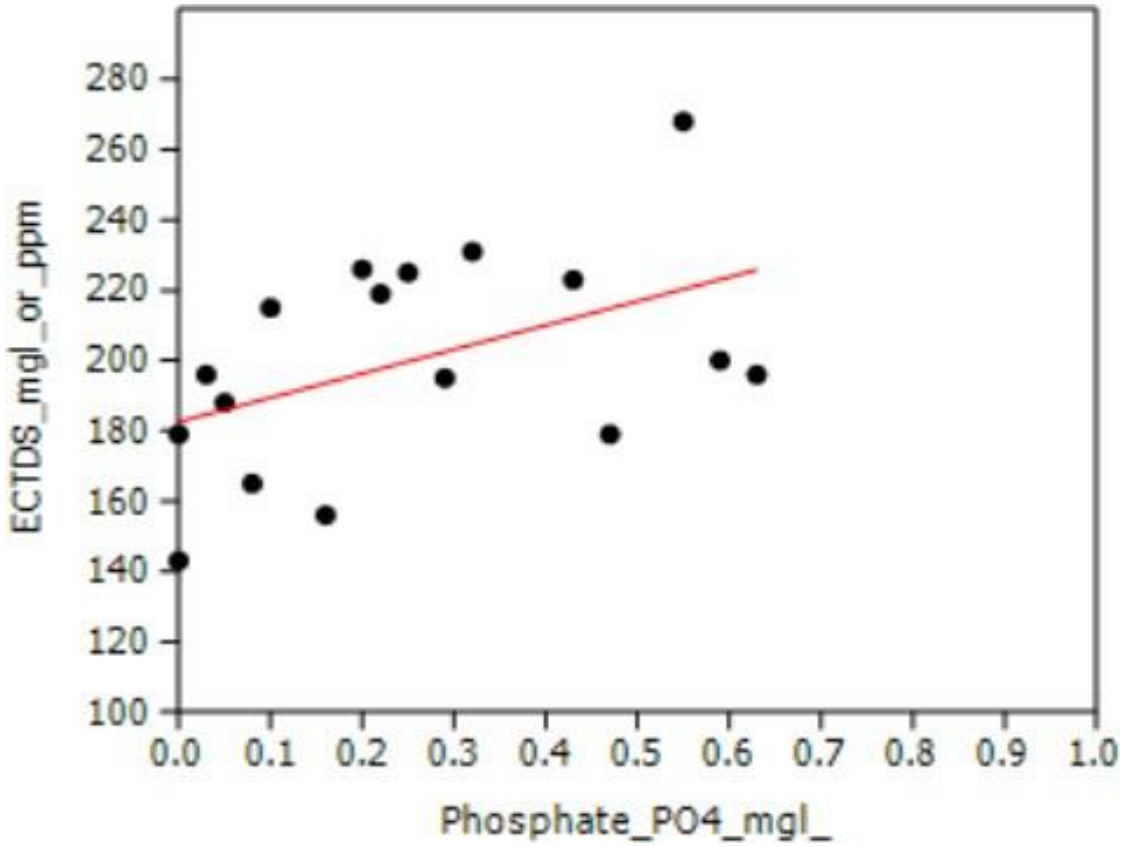
Additional Notes

- There is some evidence to suggest that **TDS and PO4 are directly proportional** and there is positive relationship on a linear regression trendline (graph 1)
- R2 = 21% variability in data / p = 0.059 therefore trendline is *probably significant* and **did not occur by chance**
- Increases in TDS have been linked to increases in phosphate concentrations

- Temporally Phosphate above the works is mostly okay displaying natural changes over time
- **Below the works is extremely erratic in p** displaying unnatural behavior of phosphate and potentially an indicator of frequent discharges from the works
- Comparisons can be seen in graph 2

- Finally there is some evidence to suggest **phosphate is higher in the evenings** indicating that spills from the works may be occurring later on in the day (this was confirmed to be normal by DCWW)
- There is **no evidence to suggest local agricultural** factors are impacting phosphate levels measured at this location

1 Comparing TDS and Phosphate



Ordinary Least Squares Regression: Phosphate_PO4_mgl_-ECTDS_mgl_or_ppm

Slope *a*:	68.624	**Std. error *a*:**	33.692
Intercept *b*:	182.59	**Std. error *b*:**	11.073

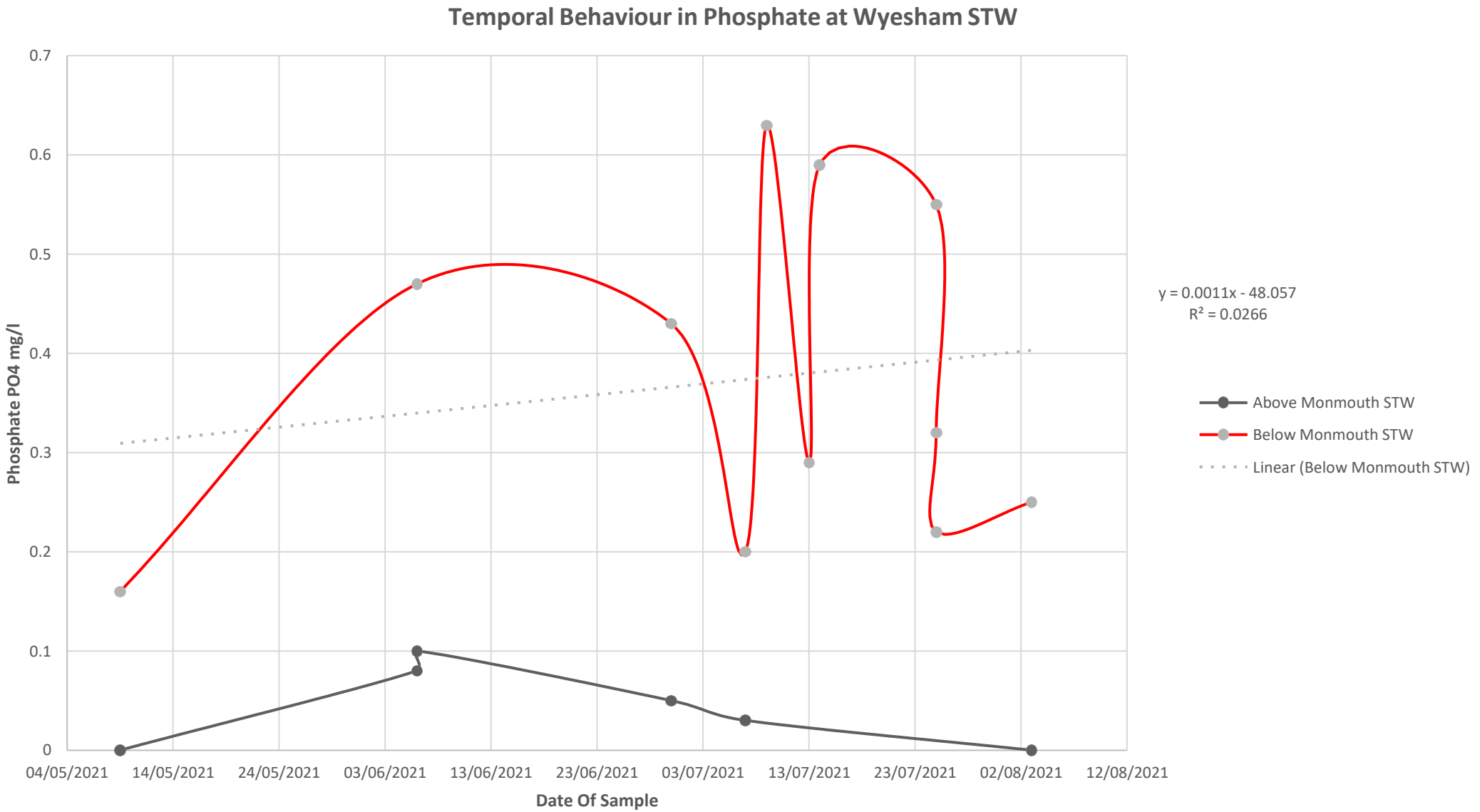
95% bootstrapped confidence intervals (*N* = 1999):

Slope *a*:	(-11.051, 133.62)
Intercept *b*:	(161.38, 201.43)

Correlation:

***r*:**	0.46545
***r*²:**	0.21665
***t*:**	2.0368
***p* (uncorr.):**	0.059723
Permutation *p*:	0.0576

2 Phosphate above and below the works over time



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3 Phosphate level with regards to time of sample